# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**TRIMESTER 3, 2016/2017**

**TSM2691 NETWORK SYSTEM FOR MULTIMEDIA**
(All Sections / Groups)

31$^{st}$ MAY 2017
9:00 a.m. – 11:00 a.m.
(2 Hours)

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**INSTRUCTION TO STUDENTS**

1. This paper consists of **3** pages with **SIX (6)** questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the answer booklet provided.

## QUESTION 1

A. Networks may be classified according to a wide variety of characteristics. List and describe, to provide suitable elaboration for, any THREE (3) aspects that can be used to classify a network.

(6 marks)

B. An 8-bit grey level image has a grey-value between 0 and 255 and each pixel is represented by a single byte. Define the terms *bitmap* and *image resolution*.

(4 marks)

## QUESTION 2

A. One of the characteristic of Multimedia is it may be *nonlinear* or *linear*.
- i)      Define *nonlinear* and *linear* multimedia.           (2 marks)
- ii)     Provide an example for *nonlinear* and *linear* multimedia.     (2 marks)
- iii)    Justify the answers you provided in part (ii).           (2 marks)

B. Sound is a wave phenomenon like light, but is macroscopic and involves molecules of air being compressed and expanded under the action of some physical device. Describe any TWO (2) basic concepts about sound.

(4 marks)

## QUESTION 3

A. It is assumed that a *web cache* will be closer to the client, thereby having a smaller response time and also may reduce traffic on the network's access link. Provide ONE (1) possible drawback caused by *caching*.
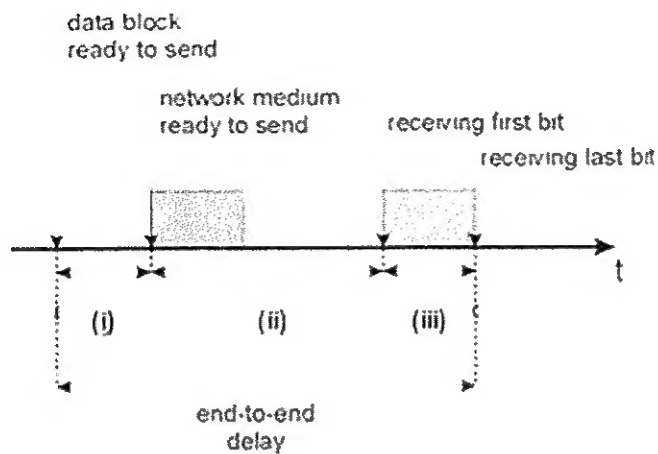
(2 marks)

B. *Temporal relationship* is the relationship between objects involving time. List any TWO (2) important aspects for the classification of *temporal relationships*.

(2 marks)

C. Below is a diagram depicting *networking delay*, label all three components marked by (i), (ii) and (iii).

(3 marks)



D. Computer-based simulation is an effective way of pretesting proposed systems and can be classified as continuous or discrete-event simulation. Define continuous simulation.

(3 marks)

## QUESTION 4

A. Though Multimedia consists of a combination of multiple media types, text still plays a vital role in Multimedia. Differentiate between *plain text* and *rich text*.

(6 marks)

B. There are two types of display methods used to display video; *interlace scanning* and *progressive scanning*. Explain *interlace scanning*.

(4 marks)

**Continued...**

## QUESTION 5

A. Given the following table, construct the Huffman tree and state the encoding for A, B, C and D.

(5 marks)

| Value | Frequency |
|-------|-----------|
| A | 11 |
| B | 3 |
| C | 7 |
| D | 2 |

B. Given the following table, use the Deficit Round Robin (DRR) algorithm with 200 byte quantum size to illustrate the end of each iteration until all packets are sent.

(5 marks)

| | Packets (byte) | | |
|---|-----|-----|-----|
| A | 700 | 200 | |
| B | 200 | 100 | 300 |
| C | 350 | | |

## QUESTION 6

A. What is the display resolution (in terms of width and height) of an image with 4,294,967,296 colours that requires 1,555,200 bytes of storage?

(4 marks)

B. Determine the size of a 3 minutes 30 seconds song with a 192,000 Hz sampling rate and a bit depth of 40 bits in stereo.

(2 marks)

C. Given a video clip of 120 minutes with a resolution of 1920 x 1080 pixels, colour depth of 36 bits, and frame rate of 24 fps, calculate the following:
   i)   Bitrate of the video in Gbps                                  (2 marks)
   ii)  Size of the video in TB                                       (2 marks)

**End of Paper**